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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/737,418	12/15/2003	Steven E. Molnar	NVDA/P001024	6363

			EXAMINER
26291	7590	08/31/2005	CASCHERA, ANTONIO A

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ART UNIT	PAPER NUMBER
2676	

DATE MAILED: 08/31/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	10/737,418	MOLNAR ET AL.
	Examiner	Art Unit	
	Antonio A. Caschera	2676	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>20 June 2005</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
    closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-20</u> is/are pending in the application.

  4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) <u>11-20</u> is/are allowed.

6)☒ Claim(s) <u>1-9</u> is/are rejected.

7)☒ Claim(s) <u>10</u> is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>15 December 2003</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☐ All   b)☐ Some * c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
      application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
     Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
     Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1.   Claims 1, 2 and 5 are rejected under 35 U.S.C. 102(e) as being anticipated by Baldwin et

al. (U.S. Patent 6,847,370 B2).

In reference to claim 1, Baldwin et al. discloses an improvement on a graphics memory

architecture oriented in a tiled format (see column 2, lines 3-5). Baldwin et al. discloses the

architecture including a rasterizer that operates upon tiles, these tiles corresponding to an 8x8

square of pixels that are screen aligned (see column 4, lines 13-15). Baldwin et al. also discloses

2D and 3D primitives being broken up down into tiles for processing (see column 4, lines 13-15).

Note, since Baldwin et al. discloses breaking down primitives into tiles, the Office interprets

Baldwin et al. to inherently disclose partitioning an image into tiles because images are made up

of 2D primitives. Baldwin et al. discloses the rasterizer creating a tile message that comprises a

tile's coordinates and a tile mask (see column 11, lines 15-19). Baldwin et al. also explicitly

discloses that the tiles are accessed by tile number (see column 2, lines 3-8). Note, the Office

interprets that such tile message of Baldwin et al. is functionally equivalent to Applicant's, "at

least one storage resource," as such message must be stored in some sort of storage since it is

sent to other system elements (i.e. Shading Unit) for further processing (see column 16, lines 44-

46). Baldwin et al. discloses the tile mask being generated by testing to see which fragments in a

tile are inside a primitive using sample point positioning data (see column 11, lines 13-15 and

column 12, lines 13-14 and 22-35).

In reference to claim 2, Baldwin et al. discloses all of the claim limitations as applied to

claim 1 above. Baldwin et al. discloses the rasterizer creating a tile message that comprises a

tile's coordinates and a tile mask (see column 11, lines 15-19). Baldwin et al. discloses the tile

mask being generated by testing to see which fragments in a tile are inside a primitive using

sample point positioning data (see column 11, lines 13-15 and column 12, lines 13-14 and 22-

35).

In reference to claim 5, Baldwin et al. disclose all of the claim limitations as applied to

claim 2 above in addition, Baldwin et al. discloses ANDing together different masks representing

edges of primitive fragments to return a tile mask with the inside fragments of a primitive for a

specific tile set (column 12, lines 22-26). Baldwin et al. discloses the rasterizer creating a tile

message that comprises a tile's coordinates and a tile mask (see column 11, lines 15-19). Note,

the Office interprets that such tile message of Baldwin et al. is functionally equivalent to

Applicant's, "at least one storage resource," as such message must be stored in some sort of

storage since it is sent to other system elements (i.e. Shading Unit) for further processing (see

column 16, lines 44-46).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

2.   Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Baldwin et al.

(U.S. Patent 6,847,370 B2).

In reference to claim 6, Baldwin et al. discloses all of the claim limitations as applied to

claim 1 above, Baldwin et al. does not explicitly disclose the number of entries in memory being

less than the number of tiles in the image however, at the time the invention was made, it would

have been obvious to one of ordinary skill in the art to implement a memory architecture in

Baldwin et al. that is capable of storing less data than represented upon a display device.

Applicant has not disclosed that having memory resources to store less data than represented by

an image on a screen provides an advantage, is used for a particular purpose, or solves a stated

problem. One of ordinary skill in the art, furthermore, would have expected Applicant's

invention to perform equally well with tile messaging for each tile of Baldwin et al. because such

a system configuration is a matter of design choice as preferred by the designer and to which best

suits the application at hand. Further, it would have easy to modify Baldwin et al. to implement

only 1 tile message per scanline (a scanline includes many tiles) since scanlines are processed in

parallel (see column 1, lines 30-37), further supporting the claim of design choice. Therefore, it

would have been obvious to one of ordinary skill in this art to modify Baldwin et al. to obtain the

invention as specified in claim 6.

3.   Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Baldwin et al.

(U.S. Patent 6,847,370 B2) in view of Willis et al. (U.S. Publication 2003/0107578 A1).

In reference to claim 3, Baldwin et al. discloses all of the claim limitations as applied to

claim 1 above. Baldwin et al. does not explicitly disclose storing a tile state in memory however

Willis et al. does. Willis et al. discloses a method, apparatus and signal-bearing medium for

sending only data that has changed (see lines 1-3 of abstract). Willis et al. discloses a buffer

containing an entry for each tile within a frame buffer (see lines 3-4 of paragraph 31). Willis et

al. discloses each entry comprising a tile address translation field and a tile state field, which

indicates whether data has been changed (see lines 5-8 of paragraph 31). It would have been

obvious to one of ordinary skill in the art at the time the invention was made to implement the

tile state recording techniques of Willis et al. with the tile fragment processing techniques of

Baldwin et al. in order to maximize the displaying of frame data and display device refreshes by

determining whether displayable data has been changed, thereby conserving system power and

bandwidth (see paragraphs 2-3 of Willis et al.).

4.   Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Baldwin et al.

(U.S. Patent 6,847,370 B2) in view of Robotham et al. (U.S. Patent 6,704,024 B2).

In reference to claim 4, Baldwin et al. discloses all of the claim limitations as applied to

claim 1 above however, Baldwin et al. does not explicitly disclose storing a timestamp value in a

memory entry. Robotham et al. discloses a server/client system for browsing visual content

using rasterized representations (see column 1, lines 13-20) wherein the client can store a

timestamp value with a cached representation of the content for determinations of whether

refresh actions are required (see column 45, lines 52-63). It would have been obvious to one of

ordinary skill in the art at the time the invention was made to implement the timestamp

refreshing techniques of Robotham et al. with the tile fragment processing techniques of Baldwin

et al. in order to update memory caches which satisfy user preferred viewing visual content in

graphics systems (see column 45, lines 29-35 of Robotham et al.).

5.   Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baldwin

et al. (U.S. Patent 6,847,370 B2) in view of Saito et al. (U.S. Publication 2004/0212619 A1).

        In reference to claim 7, Baldwin et al. discloses all of the claim limitations as applied to

claim 1 above. Baldwin et al. does not explicitly disclose outputting the position associated with

at least one fragment when a conflict does not exist. Saito et al. discloses an image rendering

device and method which divides image data into, "chunks" representing 8x8 pixel areas (see

paragraph 3 and paragraph 61, lines 1-7). Saito et al. discloses further dividing chunks into,

"stamps" which are smaller 2x2 area pixels of chunk data (see paragraph 94, lines 1-4). Saito et

al. discloses determining merging chunk data whereby conflicting chunk data is determined via a

pixel-by-pixel basis (see paragraph 92, lines 1-4). Saito et al. discloses that when no conflict is

detected, pixel data is written into the existing chunk (see paragraph 89, last 3 lines) which the

office interprets as outputting the position associated with at least one fragment since pixels

comprise of position data and such data is represented by a fragment as non-conflicted data (see

Figure 14). It would have been obvious to one of ordinary skill in the art at the time the

invention was made to implement the tile fragment processing techniques of Baldwin et al. with

the pixel status storing techniques of Saito et al. in order to save processing cycles and therefore

produce a more efficient image rendering system when required to determine which pixels need

to be processed allowing data which does not conflict with other data to be properly displayed

and therefore allowing for only those pixels which require processing to be performed upon (see paragraphs 7-8 of Saito et al.).

In reference to claim 8, Baldwin et al. discloses all of the claim limitations as applied to claim 1 above. Baldwin et al. does not explicitly disclose outputting a token when a predetermined number of quads are received. Saito et al. discloses an image rendering device and method which divides image data into, "chunks" representing 8x8 pixel areas (see paragraph 3 and paragraph 61, lines 1-7). Saito et al. discloses further dividing chunks into, "stamps" which are smaller 2x2 area pixels of chunk data (see paragraph 94, lines 1-4). Saito et al. discloses determining merging chunk data whereby conflicting chunk data is determined via a pixel-by-pixel basis (see paragraph 92, lines 1-4). Saito et al. also discloses outputting an overflow signal to a signal generator which determines whether to generate a chunk flush signal (see paragraph 73 and Figure 8). Note, the office interprets that since the overflow signal triggers a flush of memory, the overflow signal is seen as functionally equivalent to the token of applicant's claim while the number of quads of applicant's claim refers to the number of chunks in Saito et al., which are already stored and waiting to be flushed out. It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the tile fragment processing techniques of Baldwin et al. with the pixel status storing techniques of Saito et al. in order to save processing cycles and therefore produce a more efficient image rendering system when required to determine which pixels need to be processed allowing data which does not conflict with other data to be properly displayed and therefore allowing for only those pixels which require processing to be performed upon (see paragraphs 7-8 of Saito et al.).

6.   Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Baldwin et al.

(U.S. Patent 6,847,370 B2), Saito et al. (U.S. Publication 2004/0212619 A1) and further in view

of Hinton et al. (U.S. Publication 2003/0115267 A1).

In reference to claim 9, Baldwin et al. and Saito et al. disclose all of the claim limitations

as applied to claim 8 above, however neither Baldwin et al. nor Saito et al. explicitly disclose

updating a timestamp when the token is output. Hinton et al. discloses methods for accessing

authorization systems whereby a computer system implements a, "refresh enrollment token"

indicating that a user's identity cookie must be refreshed and refreshes the cookie timestamp (see

paragraph 7 and paragraph 218). It would have been obvious to one of ordinary skill in the art at

the time the invention was made to implement the timestamp refreshing based upon token

techniques of Hinton et al. with tile fragment processing techniques of Baldwin et al. and pixel

status storing techniques of Saito et al. in order to ensure that the most persistent, up-to-date data

is kept across multiple interconnected devices (see paragraph 231, lines 1-2 of Hinton et al.) so

that these devices may accurately operate with one another and the best output is guaranteed.

Allowable Subject Matter

7.   Claims 11-20 are allowed.

The following is an examiner's statement of reasons for allowance:

In reference to claim 11, the prior art of record (Baldwin et al. (U.S. Patent 6,847,370

B2), Saito et al. (U.S. Publication 2004/0212619 A1), Willis et al. (U.S. Publication

2003/0107578 A1), Robotham et al. (U.S. Patent 6,704,024 B2) and Hinton et al. (U.S.

Publication 2003/0115267 A1)) does not explicitly disclose determining whether or not a

position conflict exists during fragment shading by outputting a stall signal indicating whether or

not new data will be accepted, in combination with the further limitations of claim 11.

In reference to claims 12-20, claims 12-20 are also indicated as allowable because they

claim dependency upon allowable claim 11.

Any comments considered necessary by applicant must be submitted no later than the

payment of the issue fee and, to avoid processing delays, should preferably accompany the issue

fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for

Allowance."

8.   Claim 10 is objected to as being dependent upon a rejected base claim, but would be

allowable if rewritten in independent form including all of the limitations of the base claim and

any intervening claims.

In reference to claim 10, the prior art of record (Baldwin et al. (U.S. Patent 6,847,370

B2), Saito et al. (U.S. Publication 2004/0212619 A1), Willis et al. (U.S. Publication

2003/0107578 A1), Robotham et al. (U.S. Patent 6,704,024 B2) and Hinton et al. (U.S.

Publication 2003/0115267 A1)) does not explicitly disclose outputting a token when a position

conflict is detected within a tile in combination with delaying processing of a fragment that

corresponds to the position conflict.

Response to Arguments

9.   Applicant's arguments, see page 6 of Applicant's Remarks, filed 06/20/05, with respect

to the objection of the drawings have been fully considered and are persuasive. The objection of

the drawings has been withdrawn since informalities regarding reference numbers have been

corrected for.

10.   Applicant's arguments, see page 6 of Applicant's Remarks, filed 06/20/05, with respect

to the objection of the specification have been fully considered and are persuasive. The

objection of the specification has been withdrawn since informalities regarding the abstract have

been corrected for.

11.   Applicant's arguments, see page 6 of Applicant's Remarks, filed 06/20/05, with respect

to the objection of claims 6 and 18 have been fully considered and are persuasive. The objection

of claims 6 and 18 has been withdrawn since minor informalities have been corrected for.

12.   Applicant's arguments, see pages 6-11 of Applicant's Remarks, filed 06/20/05, with

respect to the rejection(s)of claim(s) 1-20 under 35 U.S.C 102(e) and 103(a) have been fully

considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon

further consideration, a new ground(s) of rejection is made in view of Baldwin et al. (U.S. Patent

6,847,370 B2).

References Cited

13.   The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure:

   a.   Aila et al., "Delay Streams for Graphics Hardware," ACM Transactions on

   Graphics (TOG), Proceedings from SIGGRAPH 2003, (July 2003). Vol. 22, Issue 3. pp.

   792-800.

- Aila et al. discloses adding a delay stream between vertex and pixel processing units to improve performance in occlusion culling and edge antialiasing.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Antonio Caschera whose telephone number is (571) 272-7781. The examiner can normally be reached Monday-Thursday and alternate Fridays between 7:30 AM and 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella, can be reached at (571) 272-7778.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
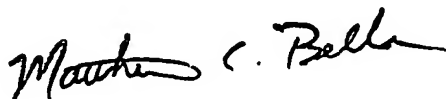
Washington, D.C. 20231

or faxed to:

571-273-8300 (Central Fax)

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the Technology Center 2600 Customer Service Office whose telephone

number is (703) 306-0377.

aac

8/23/05

MATTHEW C. BELLA
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